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ABSTRACT SUBMITTAL FORM

Deadline: Wednesday, 10 July 1996

Subject Classification Category 4.7 Hohlraum Physics ☒ Theory ☐ Experiment

*Heat Transport in High Z Plasmas at High Laser Powers K. G. Estabrook[1], J. S. De Groot[1, 2], W. L. Kruer[1], and J. P. Matte[3]; [1]LLNL, [2]UC Davis, [3]INRS Energie, Canada. High power laser plasma interactions in high Z plasmas result in very large electric fields that are required to drive the return current and maintain charge neutrality. In quasi-homogeneous plasmas, the electric field can above the Dreicer (runaway) field for high heat fluxes ($q \geq 0.2\, n_e v_e T_e$). The electrons that carry the heat flux have a strongly anisotropic velocity distribution and the weakly anisotropic diffusive approximation does not apply. Very large electric fields also occur at the interface between high and low Z plasmas. We are using Fokker-Planck and particle simulation codes to evaluate the effect that these large electric fields have on electron heat transport. We find in the quasi-homogeneous case that high energy electrons carry energy up the temperature gradient for high fluxes. The heat flux is Spitzer-like with a reduced heat transport coefficient. We find that a double layer is excited at the interface between high and low Z plasmas.

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